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REMARKS

By this response, claims 1, 3, 6, 14, and 19-21 have been amended. No new matter has been entered. Accordingly, claims 1-7 and 13-21 are pending in this application.

Claim Objections

Claims 1, 3, and 20 were objected to for the reason noted in the office action. These objection have been overcome by the above amendments.

Rejection under 35 USC 112, first paragraph.

Claim 14-18 are rejected under 35 USC 112, first paragraph, as failing to comply with the written description requirement. This rejection is respectfully traversed. To comply with the written description requirement of 35 U.S.C. 112, para. 1, each claim limitation must be expressly, implicitly, or inherently supported in the originally filed disclosure. MPEP § 2163.05. Terms need not be used in *haec verba*. *Eiselstein v. Frank*, 52 F.3d 1035, 1038 (Fed. Cir. 1995) (“application need not describe the claimed subject matter in exactly the same terms as used in the claims. . .”). Instead, the written description requirement can be satisfied by “words, structures, figures, diagrams, formulas, etc.” *Lockwood v. Am. Airlines, Inc.*, 107 F.3d 1565, 1572 (Fed. Cir. 1997).

In addition, one skilled in the art reading the specification would understand that the self-align source of the present invention has a resistance less than a similarly doped self aligned source without the vertical phosphorous-doped oxide layer. The specification as originally filed on page 8, line 17- page 9, line 18, discloses that “Figure 4A is prior art. The source doping takes place at 403. The horizontal surfaces 402 are heavily doped and the vertical surfaces 401 are lightly doped. The resistance of the self-aligned source 400 is a function of the dopant atom concentration of along it. Because of steep profiles formed during shallow trench isolation processes, the concentration of dopant atoms along the self-aligned source is not uniform. Atoms implanted in the steep slope or vertical surfaces 401 have a lower effective concentration due to the nature of the implant process. This decrease in concentration along the vertical surfaces 401 of the self-aligned source, leads to higher than expected self aligned source resistance. This problem increases as the depth of the shallow trench increases and this is one of the limiting factors for increasing the trench depth. Figure 4B illustrates self-aligned source 400

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doping according to one embodiment of the invention. Figure 4B is prior to re-oxidation and after source implants 403 and phosphorus doped oxidation 404 and etching. Phosphorus doped oxide has been removed from the horizontal surfaces 402 so that the phosphorus doped oxide 404 only remains on the vertical surfaces 401. Figure 4C illustrates self-aligned source 400 doping according to one embodiment of the invention. Figure 4C is the self-aligned source of figure 4B after re-oxidation. The vertical surfaces 401 have increased doping from phosphorus diffusing out of the phosphorus doped oxide 404. Thus, the vertical surfaces 401 and horizontal surfaces 402 are more evenly doped than the respective surfaces of figure 4A. Furthermore, by supplying an additional source of dopant directly to the vertical surfaces 401, the overall self-aligned source resistance can be improved. The rail resistance-limiting factor for trench depth can be greatly reduced or eliminated." (emphasis added).

This disclosure and comparing FIGS. 4A-4C, at least inherently, if not explicitly, supports the limitation that the self-align source of the present invention has a resistance less than a similarly doped self aligned source without the vertical phosphorous-doped oxide layer. For example, one skilled in the art would understand that the FIG. 4A and FIG. 4B, since being compared in the discussion of the disclosure and having the same numbering, have similarly doped surfaces 401 and 402, by doping 403. However, the self-aligned source of FIG. 4A does not have a uniformed dopant concentration which limits trench depths. Unlike the structure in FIG. 4A, the problem of a non-uniformed dopant concentration is addressed by the phosphorous doped oxide 404 being provided only on the vertical surfaces 401. With a more uniformed dopant concentration, the self-aligned sources of FIG. 4B and 4C, provide improved resistance, and hence by deduction, a trench depth deeper than the similarly doped self aligned source without the vertical phosphorous-doped oxide layer. Accordingly, Applicants believe that the above noted limitation of claims 14-18 complies with the written description requirement. In view of the above remarks and amendment, withdrawal of the rejection to claims 14-18 under 35 USC 112, first paragraph, is respectfully requested.

Rejection under 35 USC 112, second paragraph.

Claims 14-18 are rejected under 35 USC 112, second paragraph, as being indefinite. This rejection has been overcome by the above amendment to claim 14. Withdrawal of this rejection is respectfully requested.

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Rejection under 35 USC 102(b)

Claims 1, 2, 4, 6, 7, 19, 20 and 21 are rejected under 35 U.S. C. 102(b) as being anticipated by Ohshima et al. (5, 194,929). This rejection is respectfully traversed in view of the following remarks.

As the Examiner is well aware a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. See, e.g., *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

Independent claims 1, 6, 19, 20 and 21 have been amended to recite, *inter alia*, the limitation of "a phosphorous doped oxide layer provided along substantially vertical edges of the first oxide layer, the first polysilicon layer, the second oxide layer and the second polysilicon layer, said phosphorous-doped oxide layer extending no higher than the second polysilicon layer." The phosphorous-doped oxide layer 10 of Ohshima et al. extends higher than the second polysilicon layer 6. See FIG. 3D. As such Ohshima et al. fail to teach or suggest each and every element as set forth in claims 1, 2, 4, 6, 7, 19, 20 and 21, as amended. Accordingly, withdrawal on this rejection is respectfully requested.

Rejection under 35 USC 103(b)

Claim 13 is rejected under 35 USC 103(a) as being unpatentable over Ohshima et al. in view of Riedel (US 6,732,241). This rejection is respectfully traversed.

As mentioned above, the phosphorous-doped oxide layer 10 of Ohshima et al. extends higher than the second polysilicon layer 6. See FIG. 3D. As such Ohshima et al. fail to teach or suggest the limitation of "a phosphorous doped oxide layer provided along substantially vertical edges of the first oxide layer, the first polysilicon layer, the second oxide layer and the second polysilicon layer, said phosphorous-doped oxide layer extending no higher than the second polysilicon layer" as set forth in claim 13, as amended. Riedel is cited for disclosing a computer having a system bus and a flash memory device. Accordingly, the combined teachings of Ohshima et al. and Riedel would fail to produce the recited invention of claim 13. As such, withdrawal of this rejection is respectfully respected.

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The applicants believe that all claims are in condition for allowance. The examiner is encouraged to contact the undersigned to resolve efficiently any formal matters or to discuss any aspects of the application or of this response.

Respectfully submitted,
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